

An Approach for IOT based Power Consumption and Usage Minimization

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ABSTRACT

IOT is playing a very important role in information technology. Since, we all know that internet provides us the facility to share and access our useful information and the main role of IOT is to keep an eye on devices, and intake of electricity and how it can be used in our future houses to consume the energy. And so, in this era the smart homes and energy intake that will be beneficial for our home that includes-money usage in a proper manner. In previous approach we used techniques such as- genetic algorithm, apriori random pattern findings approaches; also some hybrid approach is used. Here approaches have been used that provides less solution. Because they have low accuracy intake parameters. In this paper ANN approach has been used that provides accurate result. It works on removing of noise and then find the accurate output in the field of electricity intake. The framework that we have used is JAVA and inputs or say parameters used are- accuracy, precision etc. are used to check an efficient proposed work. Then in future a hardware implementation is left.

Keywords

Energy consumption, ANN, Apriori Algorithm, IoT Devices, Smart Home, Energy Consumption.

1. INTRODUCTION

In this era of science we know that the energy which we are taking from the nature is not extending its life but its reducing or say more and more energies are losing from it. But now it is important to prevent that energy power. So, for that IOT plays a vital role in consumption of energy over the smart homes systems that we all wish to have. IOT uses Ip address IPV6 this provides the speed of data transfer. So, that data sharing also plays an important role on those gadgets that uses IP in smart homes applications [1]. To save our environment it also plays an important role. We have mentioned some of the strategies to develop an IOT product [2].

Most of the creators decided to build a radio based products according to the need of the applications where BLE radios work well for small and low-powered devices, but need a gateway to communicate with internet [3]. One more thing which needs to be done is the power which is required to send and receive messages from Bluetooth to mobile phones [4].

Wi-Fi power consumption is directly proportional to the quantity of data the radio is transmitting. For example: listening to music online, browsing internet also consumes more power as compare o the low bandwidth applications as sensor data and for high bandwidth applications, it is good to connect directly to an AC or else to have a separate charge management circuit that allows random recharging of the device to see that the device power is ON [5].

2. RELATED WORK

In our previous technique the work which helps in intake of power or energy analyzing discussed. So, IOT helps in smart homes that takes less power usage and provide better results also helps in proper data dissemination work provides us the details of IOT smart home devices [6].

The IOT gadgets that are based on the IP address the new and the individual applications for new IP conventions example: 6LOWPAN and COAP. Since, security is also necessary part that we require in our smart home devices. So, that all gadgets are covered to the IOT system to provide a safe mode. But we should know that current IP security systems do not provide all necessities. Here, we proposed two security designs key administration and secure correspondence. The main variations in these depend on the host identity protocol (HIP) in light of pre-shared keys, while the second arrangement depends upon the standard transport layer security (DTLS) [7].

We can take an example of number of groups that are researching on the subjects which we will add to IOT. Today as detecting, activation, correspondence and control turn is always in and unique more collaboration between groups is supported. If we started discussing about the IOT techniques. Then, the first question that hits our mind is that how IOT can change the world where 8 researchers has talk about it also their opinion has put up in a literature review [8] [9].

This section discuss about the IOT techniques also the area where it is implemented also one of the facility which is given to us by IOT is that different devices can communicate to each other by assigning them a unique IP address to a particular devices. In further work we will provide more details about the algorithms that help in data communication and finding usage of electronic components using IPV6 protocol [10].

3. PROPOSEDMETHODOLOGY

An Artificial Neural Network has been used to find out the optimal solution for energy consumption that provides an efficient house hold devices.

Following are the steps that contributed in the power consumption monitoring for the large datasets that extracted from IOT enables house hold devices.

Algorithm steps which taken for processing the proposed approach.

The proposed system will have ANN approach for the data analysis and prediction.

An usage of tan-sigmoid transfer function (tensing) was used in the hidden layers while linear transfer function will used for the output layers.

A provision of training and testing phase in the ANN approach is going to perform in the system.

An automated alert generation and monitoring usage interface is going to show the effectiveness of our approach.

Our proposed work is going to work on feed forward selection algorithm using the feature of ANN.

Propagation, finding patterns and usage according to requirement.

Weight update: Multiply its output delta and input activation to get the gradient of the weight.

Apply sigmoid function over the propagation data obtained.

Finding outcome alerts.

Notify to users.

A Designed step algorithm which is presented in below section which help in execution of the presented scenario.

Pseudo Code Algorithm:

Input: IoT device data, energy consumption log, Min weight threshold value=18, ANN parameters

Output: High usage device voltage, parameter outputs

Steps:

Begin [

Finding device information ();

Int log[]=Access Log();

Foreach(log 1-n)

{

Finding the log distance();

logImpact();

logVerify(weight,log)

{

If(log>=weightmin)

{

Return usage alert;

MonitorHighUsage();

MonitorLowUsage();

}

Return deviceId;

}

ComputeParam();

Return computational parameters;

}

] End;

The above steps and pseudo code shows the execution of the proposed system which help in energy consumption analysis [11]. It is the ANN based approach which helps in finding hidden values, their correlation and further

monitoring devices having high usage in energy consumption.

4. EXPERIMENT SETUP AND RESULT ANALYSIS

This section involves the usage of windows operating system, RAM; 1TB of hard disk is required in this. We have used JAVA language and server side we have WAMP for dataset processing. The algorithms that we have used also used java for their implementation. Swing provides the graphical user interface (GUI) such as text boxes, buttons, split panes and tables. Since, technologies gone very advanced so, now swing has provided us many more features as compare to earlier abstract window toolkit. Proposed and existing algorithms were applied step-by-step in both the proposed framework from datasets [12].

Results Analysis: Here a result observed in experiment shows the computation which performed. In the table 1 below, an observation table is made over the given datasets with the existing greedy based technique. A comparison graphical analysis is performed which shows the efficiency on computational of our proposed technique over existing Apriori algorithm [13, 14].

On comparing the results of the existing and proposed algorithm we have calculate that the result of our proposed approach are better than the existing approach. Hence we can say that our proposed approach is better solution for the future use. Now we can see the variations in the existing as well as our proposed approach.

STATICALLY RESULT

<u>Algorithm System</u>	<u>Accuracy %</u>	<u>Precision %</u>	<u>Recall %</u>
Apriori Approach	71.2	82.20	81.10
Optimized ANN Approach	73.10	84.50	86.1

5. GRAPHICAL ANALYSIS

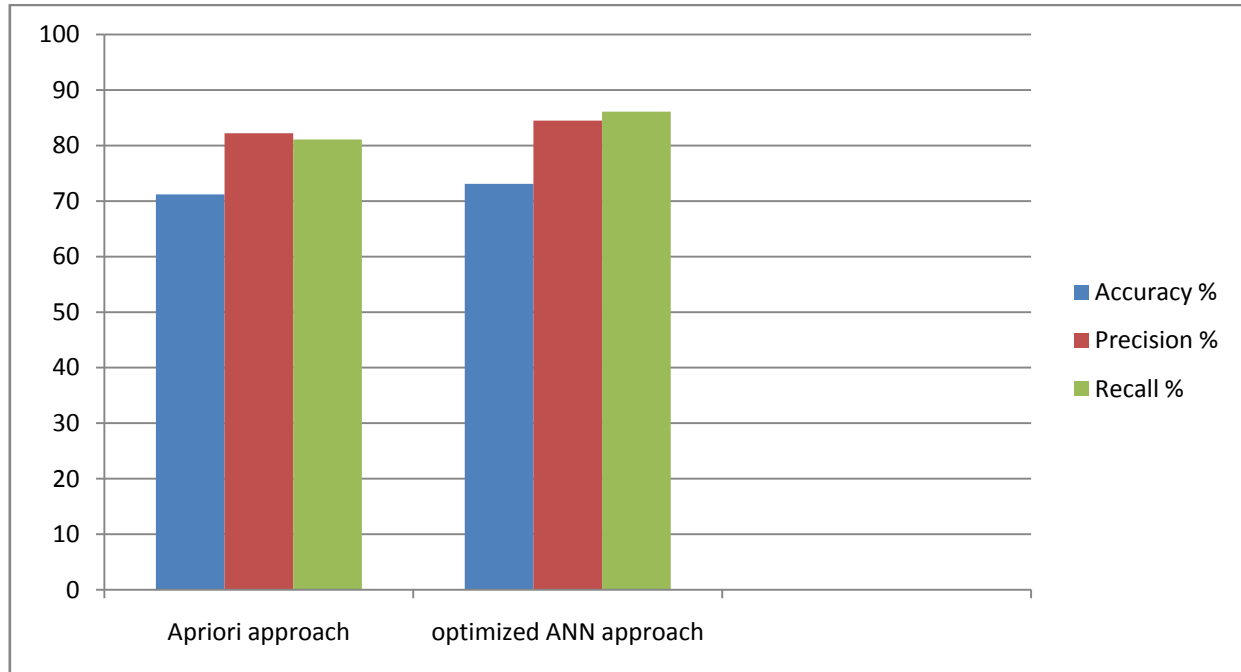


Fig 1: Comparison Analysis.

In the figure 1 above, a comparison analysis using the bar graph is presented.

6. CONCLUSION

Power consumption is a very important research that is required to find out the estimation about IOT products, also minimizing power consumption. Also a crucial point is that how we can control energy and component costs. Radios are the key components that maintain the budget of the IOT products also the strategies that can be very helpful in creating a new innovation in the field of the smart home devices. In the proposed technique we have used the ANN algorithm for the removal of noise also the energy consumption monitoring. A large no. of datasets has been taken to find out the ultimate cost values for the effective devices. A work which can further extend is hardware implementation and monitoring the traffic data real feed. Thus an enhancement can be done in this direction.

7. ACKNOWLEDGMENTS

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